

U.S.S.N. 10/658,709

Remarks

Thorough examination by the Examiner is noted and appreciated.

The claims have been further amended to overcome Examiners 112 rejections and to define over the prior art.

No new matter has been added.

Support for the amendment is found in the previously presented claims, the Figures, including Figure 5, and in the Specification at:

Line 6, beginning on page 16:

"It will be appreciated by those skilled in the art that the nozzle head 50 separates the primary gas stream 72 into the multiple secondary gas streams 72a, which strike the surface of the liquid primer 42 in a dispersed pattern that generally matches the pattern of the nozzle openings 58 in the nozzle plate 56. Accordingly, each of the multiple secondary gas streams 72a strikes the liquid primer 42 at a substantially reduced gas pressure of typically about 0.75 Kpa. This optimizes generation of primer vapor 60 in the tank body 41 while preventing or substantially reducing the formation of liquid primer droplets which would otherwise be drawn with the primer vapor 60 into the process chamber 64 through the vapor outlet tube 70 and contaminate the wafer substrate 66 therein. Consequently, the

U.S.S.N. 10/658,709

primer layer 62 deposited on the substrate 66 is substantially **uniform in thickness** and lacks **liquid primer droplets** which would otherwise cause uneven etching of a photoresist layer (not shown) deposited on the primer layer 62 in subsequent processing steps."

Premature Finality

Examiner alleges that Applicants previous amendment necessitated the newly cited art not of record (i.e., Harada and Bowles). However, Applicants amended their claims to recite a **planar** exposed surface of to overcome Examiners overly broad interpretation of Applicants claims purporting to make Applicants claimed invention equivalent or analogous to bubble vapor generators cited in previous Office Actions. Therefore, Applicants amendment should have been expected by Examiner, and has not **necessitated** the newly applied art. Rather, the newly applied art arguably presents more relevant art that the previous cited bubble vapor generators.

See e.g., Applicants previous response to Applicants rejection:

"Examiner argues that Applicants claims do not **exclude** gas bubblers and that Applicants claimed liquid vapor interface reads on a liquid vapor

U.S.S.N. 10/658,709

interface of a bubble submerged in the liquid.

Applicants respectfully note that while Applicants do not agree with Examiners overly-broad interpretation of Applicants 'exposed surface' and 'liquid vapor interface', the claims have been amended to define over Examiners overly-broad interpretation of Applicants claims to further prosecution on the merits."

See also the MPEP:

MPEP 706.07

Before final rejection is in order a clear issue should be developed between the examiner and applicant. To bring the prosecution to as speedy conclusion as possible and **at the same time to deal justly by both the applicant and the public**, the invention as disclosed and claimed should be thoroughly searched in the first action and the references fully applied; and in reply to this action the applicant should amend with a view to avoiding all the grounds of rejection and objection. Switching from one subject matter to another in the claims presented by applicant in successive amendments, **or from one set of references to another by the examiner** in rejecting in successive actions claims of **substantially the same subject matter**, will alike tend to defeat attaining the goal of reaching a clearly defined issue for an early termination, i.e., either an allowance of the application or a final rejection.

MPEP 904.03

It is normally not enough that references be selected to meet only the terms of the claims alone, especially if only broad claims are presented; but the search should, insofar as possible, also

U.S.S.N. 10/658,709

cover all subject matter which the examiner reasonably anticipates might be incorporated into applicant's amendment. Applicants can facilitate a complete search by including, at the time of filing, claims varying from the broadest to which they believe they are entitled to the most detailed that they would be willing to accept.

MPEP 706.07(A)

A second or any subsequent action on the merits in any application or patent involved in reexamination proceedings should not be made final if it includes a rejection, on prior art not of record, of any claim amended to include limitations which should reasonably have been expected to be claimed. See MPEP § 904 *et seq.*

Therefore, Applicants respectfully submit that Examiner should have reasonably expected Applicants amendment and therefore respectfully request Examiner to withdraw Finality and allow entry of the present amendments, in order to allow Applicants a fair opportunity to define their invention over the newly cited art, as they are entitled to do.

Claim Rejections under 35 USC 112

The claims have been amended to overcome Examiners rejection.

Claim Rejections under 35 USC 102/103(a)

U.S.S.N. 10/658,709

1. Claims 1, 2, 5, 9, 11, 17, 18, 20, 22, 23 and 24 stand rejected under 35 USC 102(b) as anticipated by, or in the alternative, under 35 USC 103(a) as being as obvious over Harada (6,402,844).

Harada et al. disclose a vapor generator and a method for carrying out vapor generation of HDMS in order to treat a semiconductor wafer in a down stream process. The apparatus and the method of Harada et al. overcome the problem of a reduction of the temperature of the heated wafer in the process chamber as vapor is passed from the vapor generator to the wafer treatment chamber (see Abstract; col 1, lines 51- col 2, line 8). Harada disclose intermittently supplying the vapor from the vapor generator, and where the process chamber is being evacuated while the vapor is being supplied (col 2, lines 34-44; col 4, lines 28-35) and the exhaust or evacuation is stopped at the same time the vapor supply is stopped (col 4, lines 36-54).

Harada et al. disclose that the vapor generator (Figure 6) may have a plurality of nozzles (shown in cross section in a linear pattern) as opposed to 1 (item 33, Figure 1) in order to increase the amount of N₂ sprayed on the surface of the HDMS

U.S.S.N. 10/658,709

solution (i.e., to increase the concentration of HDMS supplied to the process chamber (col 6, lines 35-45). Harada et al. further teach that when the vapor is not being supplied to the process chamber the concentration of HDMS continues to increase in the vapor (col 5, lines 7-20).

Harada et al. fails to disclose several elements of Applicants disclosed and claimed invention including those elements in **bold type**:

" A primer tank for generating a primer vapor for treating a substrate **with reduced primer droplet formation and improved deposition uniformity of said primer vapor on said substrate** comprising:

a tank body for containing a liquid primer to form a planar exposed surface of said liquid primer, said planar exposed surface comprising a liquid vapor interface; and,

a nozzle assembly **comprising a nozzle plate**, said **nozzle plate comprising a plurality of openings**, said plurality of openings disposed above said planar exposed surface and arranged for **directing a plurality of gas streams in a planar**

U.S.S.N. 10/658,709

dispersed pattern onto said planar exposed surface to form said primer vapor in a vapor collection space above said liquid vapor interface."

Contrary to Examiners assertions, nowhere do Harada et al. disclose a **nozzle plate**, but rather, disclose a plurality of **linear arranged nozzles**. Moreover, nowhere do Harada et al. disclose a **manifold section** as Examiner alleges.

Examiner is required to interpret the claims by giving the **terms thereof the broadest reasonable interpretation in their ordinary usage as they would be understood by one of ordinary skill in the art in light of the written specification, including drawings**, unless another meaning is intended by appellants as established in the written specification, and without reading into the claims any limitation or particular embodiment disclosed in the specification. See e.g., *In re Morris*, 127 F.3d. 1048, 1054-55, 44 USPQ2d 1023, 1027 (Fed. Cir 1997); *In re Zeltz* (893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989).

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v.*

U.S.S.N. 10/658,709

Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

"The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Moreover, nowhere do Harada et al. recognize or proved a solution to the problem that Applicants have recognized and solved:

"A primer tank for generating a primer vapor for treating a substrate with reduced primer droplet formation and improved deposition uniformity of said primer vapor on said substrate"

Rather the teachings of Harada et al. teach more nozzles for increasing an amount of N2 supplied (i.e., higher flow rates/pressure) would create the very problem that Applicants have recognized and solved.

"Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the

U.S.S.N. 10/658,709

reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure." *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

2. Claims 3 and 10 stand rejected under 35 USC 103(a) as being unpatentable over Harada et al., above, in view of Applicants description of the prior art.

Applicants reiterate the comments made above with respect to Harada et al.

Even assuming arguendo a proper motivation for combining Applicants description of the prior art with Harada et al., such combination does not produce or suggest Applicants disclosed and claimed invention.

"Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success **must both be found in the prior art, and not based on applicant's disclosure.**" *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

U.S.S.N. 10/658,709

3. Claims 13, 21, and 25 stand rejected under 35 USC 103(a) as being unpatentable over Harada et al., above.

Applicants reiterate the comments made above with respect to Harada et al.

Examiner argues that radially extending rows is a matter of design choice. However, Examiner has not shown in the prior art a recognition of the a problem to be solved by Applicants structure or a teaching suggesting that Applicants structure is desirable, or would successfully accomplish a particular result.

As noted above, Harada et al. discloses a plurality of linearly arranged nozzles (in cross section) to allow an **increased amount (flow) of N2 gas to be directed at the surface (i.e., with increased droplet formation)**, thereby presenting the very problem that Applicants invention solves.

"Finally, the prior art reference (or references when combined) **must teach or suggest all the claim limitations**. The teaching or suggestion to make the claimed combination and the reasonable expectation of success **must both be found in the prior art**, and not based on applicant's disclosure." *In re Vaeck*, 947

U.S.S.N. 10/658,709

F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

4. Claim 19 stands rejected under 35 USC 103(a) as being unpatentable over Harada et al., above, in view of Applicants description of the prior art.

Applicants reiterate the comments made above with respect to Harada et al. and Applicants description of the prior art.

Even assuming arguendo a proper motivation for combining Applicants description of the prior art with Harada et al., such combination does not produce or suggest Applicants disclosed and claimed invention.

"Finally, the prior art reference (or references when combined) **must teach or suggest all the claim limitations**. The teaching or suggestion to make the claimed combination and the reasonable expectation of success **must both be found in the prior art**, and not based on applicant's disclosure." *In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).*

5. Claims 2, 9-11, 13, 21, and 25 stand rejected under 35 USC 103(a) as being unpatentable over Harada et al., above, in view

U.S.S.N. 10/658,709

of Bowles (853, 915).

Applicants reiterate the comments made above with respect to Harada et al.

Even assuming arguendo, Bowles is analogous art, and a proper motivation for modifying Harada et al. with Bowles, the fact that Bowles teaches a carburetor for supplying carbureted air to an engine where air supply pipes (7) are supplied to chambers (3) separated by a partition (2a) **to prevent violent splashing "from one end of the compartment to another"** (page 1, lines 65-70) and teaches a pair of perforated partitions (2, 11) (Fig 1, Fig 4) forming a **mixing chamber** above the gasoline to collect the carbureted air and then passing the carbureted air downstream **in response to periodic suction (including periodic backpressure)** produced by the engine cycles downstream (see page 1, lines 86-95; page 2, lines 25-45; lines 54-57), does not further help Examiner in producing Applicants invention.

For example, modifying Harada et al. with the perforated partitions in the mixing chamber of Bowles, would **change the principle of operation** of the mixing chamber of Bowles and further make the mixing chamber of Bowles (collection and mixing

U.S.S.N. 10/658,709

of carbureted air) **unsuitable for its intended purpose.**

Moreover, modifying Harada et al. with the perforated partitions in the mixing chamber of Bowles would make the plurality of nozzles of Harada et al. unsuitable for their intended purpose of supplying an increased flow rate (amount) of N₂.

"Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure." *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

"A prior art reference must be considered in its entirety, i.e., as a whole including portions that would lead away from the claimed invention." *W.L. Gore & Associates, Inc., Garlock, Inc.*, 721 F.2d, 1540, 220 USPQ 303 (Fed Cir. 1983), cert denied, 469 U.S. 851 (1984).

"If the proposed modification or combination of the prior art would change the principle of operation of the prior art

U.S.S.N. 10/658,709

invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious." In *re Ratti*, 270 F.2d 810, 123, USPQ 349 (CCPA 1959).

"If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification." In *re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

5. Claim 10 stands rejected under 35 USC 103(a) as being unpatentable over Harada et al., above, in view of Bowles above, and further in view of Applicants discussion of the prior art.

Applicants reiterate the comments made above with respect to Harada et al., Bowles, Applicants discussion of the prior art including liquid level sensors.

"Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior

U.S.S.N. 10/658,709

art, and not based on applicant's disclosure." *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Conclusion

Applicants note that the cited references, singly or in combination, nowhere recognize or provide a solution to the problem that Applicants have recognized and solved by their disclosed and claimed invention, or produce or suggest Applicants' disclosed and claimed invention, and therefore fail to make out a *prima facie* case of anticipation or obviousness.

The Claims have been amended to further clarify Applicants' disclosed and claimed invention over the prior art. Applicants respectfully request withdrawal of Finality and a favorable reconsideration of Applicants' claims.

Based on the foregoing, Applicants respectfully submit that the Claims are now in condition for allowance. Such favorable action by the Examiner at an early date is respectfully solicited.

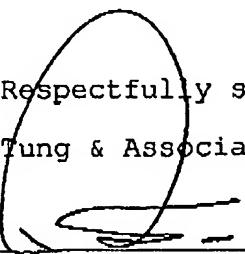
In the event that the present invention as claimed is not in

U.S.S.N. 10/658,709

condition for allowance for any reason, the Examiner is respectfully invited to call the Applicants' representative at his Bloomfield Hills, Michigan office at (248) 540-4040 such that necessary action may be taken to place the application in a condition for allowance.

Respectfully submitted,

Tung & Associates



Randy W. Tung
Reg. No. 31,311
Telephone: (248) 540-4040